BIN WITH MECHANISM FOR WRAPPING AN ITEM TO BE STORED THEREIN

FIELD OF THE INVENTION

This invention relates to storage bins.

BACKGROUND OF THE INVENTION

It is often desirable that a stored item be separated from its environment. For example, an item producing a foul odor, such as a used diaper, should be separated from its environment by a barrier impervious to the odor so as to prevent the odor from being released into the environment. To accomplish this it is known to store items such as used diapers in a bin having a tightly fitting cover. This, however, does not prevent the odor from escaping into the room when the bin is periodically opened to insert an additional used diaper.

Similarly, a food, such as a sandwich or fruit, to be stored should be separated from its environment in order preserve the freshness of the item or to prevent contamination or drying out by the environment. To accomplish this, it is known to store food items in sealed containers.

SUMMARY OF THE INVENTION

The present invention provides a bin for storing items. In accordance with the invention, as an item is inserted into the bin, it becomes individually wrapped with a self-adhering film such as a saran (i.e. a plastic having vinylidine chloride as its principal monomer). The bin comprises a base container for storing the wrapped items below a wrapping assembly. The wrapping assembly includes two trays configured to receive a roll of self-adhering film.

The wrapping assembly also includes a first and second cylindrical rollers. Rotation of the rollers are coupled to each other so that rotation of the first roller, for example by means of a knob, in one direction causes simultaneous rotation of the second roller in the opposite directions

In use, a small amount of the film is extended by hand from each roll and the ends are pressed together. Due to the self-adhesiveness of the film, the ends of the two rolls of film are thus bonded together. The bonded edge is then manually fed in between the rollers as the rollers are made to rotate. This causes the two sheets of film to pass between the rollers into the base container. As the two sheets of film pass between the rollers they are crimped together by the end sections of the rollers so as to bind the two sheets together along the edges.

An object to be stored in the bin, such as a soiled diaper or food item, is now placed between the two rolls of a film over the rollers. The rollers are then rotated so as to draw the bonded edge of film further into the container. As the sheets of film pass into the container, the object passes between the rollers. As the object passes between the rollers crimping of the film at the end sections of the rollers seals the two rolls of film around the object. After the object has passed between the rollers, the two rolls of film may be cut. The rolls of film are preferably perforated at intermittent intervals to facilitate manual cutting of the film by a user. The cut ends of the two sheets of film wrapping the object are then manually pressed together so as to bond the ends together. Further rotation of the rollers causes the object, now completely wrapped in the film, to be released from the rollers and to fall into the container.

The invention thus provides a bin for storing objects comprising:

(a) a container;

(b) a first tray and a second tray, each tray configured to receive a roll of self-adhesive film.

(c) a first roller and a second roller;

(d) driving means rotating the first and second rollers in an insertion direction.

BRIEF DESCRIPTION OF THE DRAWINGS

In order to understand the invention and to see how it may be carried out in practice, a preferred embodiment will now be described, by way of non-limiting example only, with reference to the accompanying drawings, in which:

Fig. 1 shows an exploded view of a bin in accordance with one embodiment of the invention;

Fig. 2 shows the bin of Fig. 1 with the film covers in an open state exposing the rolls of film;

Fig. 3 shows the bin of Fig. 1 with the film covers closed over the rolls of film;

Fig. 4 shows insertion of an object between into the bin of Fig. 1;

Fig. 5 shows a bin having a lid and a cover in accordance with another embodiment of the invention;

Fig. 6 shows the top assembly of the bin of Fig. 5 with the lid in an open state;

Fig. 7 shows the underside of the top assembly shown in Fig. 6;

Fig. 8 shows the top assembly of the bin shown in Fig. 5 with the cover removed;

Fig. 9 shows the underside of the top assembly of the bin of Fig. 5 showing protective blades;

Fig. 10 shows the top assembly of the bin of Fig. 5 showing a ratchet system for allowing rotation of rollers in a single direction;

Fig. 11 shows the underside of the top assembly of the bin of Fig. 5 with an object wrapped in self-adhering film after having passed between the rollers; and

Fig. 12 shows the drive system of the bin of Fig. 5.

DETAILED DESCRIPTION OF THE INVENTION

Figs. 1 to 4 show a first embodiment of a bin in accordance with the invention. The bin is shown in exploded view in Fig. 1. The bin comprises a base container **1** supporting a wrapping assembly **2**. The wrapping assembly **2** includes

two trays **4** and **5** (Fig. 2). Each of the trays **4** and **5** are configured to receive a roll of self-adhering film **3**. The self-adhering film **3** may be formed, for example, from a saran (i.e. a plastic having vinylidine chloride as its principal monomer). To place a roll of film **3** in each of the trays **3** and **4**, covers **10** are opened to expose the trays **4** and **5** (Fig. 2). After a roll of film **3** has been placed in each of the trays **4** and **5** (Fig. 1), the covers **10** are closed over the rolls of film **3** (Figs. 3 and 4).

Adjacent to the rolls of film **3** is a pair of cylindrical rollers **6** and **7**. The rollers **6** and **7** are constructed in three sections. The rollers **6** and **7** have a central section **12** formed from a resiliently compressible material such as foam rubber. An end section **11** at each end of both rollers **6** and **7** is formed from a hard material. The end sections **11** are toothed into a gear like surface so that surface of each end section of one of the rollers engages the surface in the adjacent end section of the other roller. Rotation of a knob **8** rotates the roller **6**. Rotation of the roller **6** in one direction by the knob **8** causes simultaneous rotation of the roller **7** in the opposite directions by the gear interaction between the rollers **6** and **7** at the end regions **11**. In use, the knob **8** is used to rotate the rollers **6** and **7** simultaneously in an insertion direction indicated by the arrows **30**.

In use, a small amount of the film **3** is extended by hand from each roll and the ends are pressed together. Due to the self-adhesiveness of the film, the ends of the two rolls of film are thus bonded together. The bonded edge is then manually fed in between the rollers **6** and **7** as the rollers are made to rotate in the insertion direction by turning the knob **8**. This causes the two sheets of film **3** to pass between the rollers **6** and **7** into the base container **1**. As the two sheets of film **3** pass between the rollers **6** and **7**, they are crimped together by the gear surfaces in the end sections **11** so as to be bonded together there.

An object **9** to be stored in the bin, such as a soiled diaper or sandwich, is now placed between the two rolls of a film **3**, over the rollers **6** and **7**, as shown in Fig. 4. The knob **8** is then rotated so as to rotate the rollers **6** and **7** in the insertion direction and draw the bonded edge of film further into the container **1**. As the sheets of film **3** pass into the container **1**, the object **9** passes between the rollers **6**

and 7. As the object 9 passes between the rollers 6 and 7 the material of the central region on both rollers 6 and 7 is temporarily compressed so as to allow the object 9 to pass between the rollers 6 and 7. As this occurs, crimping of the film 3 at the end sections 11 of the rollers 6 and 7 seals the two rolls of film 3 around the object 9. Furthermore, as the object 9 passes between the rollers 6 and 7, the two sheets of film are pressed against the object so as to prevent a significant amount of air from being trapped between the film 3 and the object 9. After the object 9 has passed between the rollers 6 and 7, the two rolls of film 3 may be cut. The rolls of film 3 are preferably perforated at intermittent intervals to facilitate manual cutting of the film 3 by a user. The cut ends of the two sheets of film 3 wrapping the object 9 are then manually pressed together so as to bond the ends together. Further rotation of the rollers 6 and 7 by the knob 8 causes the object 9, now completely wrapped in the film 3, to be released from the rollers 6 and 7 and to fall into the container 1. Alternatively, the two sheets of film 3 are not cut after the object 9 has passed between the rollers 6 and 7 into the container 1. Instead, the two sheets of film 3 become bonded together above the object 9 as the film continues to pass between the rollers 6 and 7 after the object 9 has passed between the rollers 6 and 7. In this case, several objects may be wrapped together in the film 3 as shown in Fig. 1.

Figs. 5 to 12 show a bin in accordance with a second embodiment of the invention. The embodiment of Figs. 5 to 12 has elements in common with the embodiment of Figs. 1 to 4, and similar components are referred to by the same reference numeral, without further comment or explanation.

The embodiment of Figs. 5 to 12 has a lid 13 supported by two arched and toothed supports 15. The each support 15 engages a drive gear wheel 17 at a different end of the roller 6. When the lid 13 is closed, each support 15 engages its drive gear wheel 17 in a rack-and-pinion mechanism so as to cause the drive gear wheel 17 to rotate in the direction of the arrow 28. (Fig. 12) An inner wheel 25 is rigidly fixed to an axle 26 of the roller 6. The inner wheel 25 supports a series of pawls 18. The pawls 18 are positioned so as to engage with teeth 27 on the inner surface of the drive gear wheel 17 in a ratcheted engagement. Thus, rotation of the

drive gear wheel **17** by the supports **15** when the lid is closed causes the inner wheel **25**, and hence the roller **6** to rotate in the same direction. Rotation of the roller **6** causes simultaneous rotation of the roller **7** by the gears in the end sections **11**, so that the rollers **6** and **7** rotate in the insertion direction (arrows **28** and **29**) as the lid **13** is closed. When the lid **13** is opened, each gear drive wheel **17** rotates in the direction opposite to that of the arrow **28** and slips over the inner wheel **25**. This engagement prevents rotation of the rollers **6** and **7** when the lid **13** is opened.

In use, a small amount of the film **3** is extended by hand from each roll and the ends are pressed together. Due to the self-adhesiveness of the film, the ends of the two rolls of film are thus bonded together. The bonded edge is then manually fed in between the rollers **6** and **7**. Feeding of the film between the rollers **6** and **7** may be facilitated by partially closing and opening the lid **13** one or more times. This causes the two sheets of film **3** to pass between the rollers **6** and **7** into the base container **1**. As the two sheets of film **3** pass between the rollers **6** and **7**, they are crimped together by the gear surfaces in the end sections **11** so as to be bonded together there.

An object **9** to be stored in the bin, such as a diaper or sandwich, is now placed between the two rolls of a film **3**, over the rollers **6** and **7**. The lid **13** is then closed so as to rotate the rollers **6** and **7** in the insertion direction and draw the bonded edges of film further into the container **1**. As the sheets of film **3** pass into the container **1**, the object **9** passes between the rollers **6** and **7**. As the object **9** passes between the rollers **6** and **7** the material of the central region on both rollers **6** and **7** is temporarily compressed so as to allow the object **9** to pass between the rollers **6** and **7**. As this occurs, crimping of the film **3** at the end sections **11** of the rollers **6** and **7** seals the two rolls of film **3** around the object **9**. Furthermore, as the object **9** passes between the rollers **6** and **7**, the two sheets of film are pressed against the object so as to prevent a significant amount of air from being trapped between the film **3** and the object **9**. After the object **9** has passed between the rollers **6** and **7**, the lid **13** may be opened, and the two rolls of film **3** may be cut above the object **9**. The rolls of film **3** are preferably perforated at intermittent

intervals to facilitate manual cutting of the film **3** by a user. The cut ends of the two sheets of film **3** wrapping the object **9** are then manually pressed together so as to bond the ends together. Further rotation of the rollers 6 and 7 closing the lid **13** causes the object **9**, now completely wrapped in the film 3, to be released from the rollers **6** and **7** and to fall into the container **1.** Alternatively, the two sheets of film **3** are not cut after the object 9 has passed between the rollers **6** and **7** into the container **1.** Instead, the two sheets of film **3** become bonded together above the object **9** as the film continues to pass between the rollers **6** and **7** after the object **9** has passed between the rollers **6** and 7.In this case, several objects may be wrapped together in the film **3.**

A cover **14** may optionally be positioned at the rolls of film **3.** The cover **14** has an aperture **21** in the cover **14** through which an object to be wrapped and stored in the container **1** is passed. The aperture **21** is positioned so as to position the object **9** over the central region **12** of the rollers **6** and **7** in order to achieve optimal wrapping. The aperture **21** may also serve to limit the size of objects that can be stored in the container **1.**

Below the compliant rollers **6** and **7** are deflection blades **19** and **20.** The deflective blades **19** and **20** part as a wrapped object passes between them. The deflection blades **19** and **20** prevent contact of the wrapped object with film on the bottom sides of the rollers **6** and **7** which might cause film to unwrap from the object.